

The Mars Microprobe Mission

Advanced Micro-Avionics for Exploration of the Martian Surface

The Mars Microprobe Mission is the second in the series of planetary missions developed by NASA's New Millennium Program. The Mars Microprobes, two of which will land on Mars in 1999, were developed to validate new technologies that can be used for a variety of space missions in the future. The Microprobe entry system is an advanced, completely passive, single stage to impact, aeroshell system that requires no guidance control or deployments to land on the Martian surface. After impacting the planet's surface at approximately 200 meters per second, the probes separate into two units, one that remains on the surface to provide a platform for the telecommunications unit, and another that penetrates beneath the surface to a depth of one meter. The extreme forces on the probes at impact required the development of a unique packaging design for the avionics that insures the survival of the electronics and provides the electrical interconnects needed to integrate the microsystem. Avionics for the probes include an advanced microcontroller for executing the mission sequence, a power converter unit to regulate the battery power the system, and a set of instruments to measure soil temperature and hardness, and water content. This paper describes the mission sequence and the advanced micro-electronics avionics package and science instruments for the microprobe mission.